United States Department of Agriculture

Soil Conservation Service

517 Gold Ave., SW
Room 3301
Albuquerque, NM 87102

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BIOLOGY TECHNICAL NOTE NO. NM-34
190

SUBJECT: ECS - BIOLOGY - PLANTINGS

Purpose. To distribute new research information which describes a method for successful plant establishment in low precipitation areas, without irrigation. The method can be used for wildlife food or cover plantings, windbreaks, erosion control, streambank filter strips, as well as for landscape plantings.

This method may be incorporated, by technical note reference, into appropriate practice standards and specifications.

Effective Date. When received.

Filing Instructions. File in Biology Technical Note binder.

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Enclosure

DIST:
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RAINFALL HARVESTING

A method which results in successful plant establishment in areas of low precipitation, without irrigation, has been developed and tested. Container transplants of adapted grasses, shrubs, and trees, as well as bare root stock, were grown in areas which received 13 and 17 inches of precipitation during the growing season.

There are two major advantages of the method. First, installation costs are much less than when using drip irrigation. Secondly, when correctly installed the method does not require follow-up, repetitive irrigations and weed control activities. It is advisable that dead plants be replaced to optimize the economics of establishment costs, and to obtain a fully stocked planting.

The method involves several steps:

STEP ONE - Prepare the planting sites by deep plowing, turning over the soil. Do this in the fall, to provide for breakdown of existing vegetation and the accumulation of soil moisture.

STEP TWO - Shape the catchments in late winter. Construct broad vee ditches of appropriate widths. At Clovis, with 17 inch growing season precipitation, a catchment 36 inches wide and 12 inches deep was sufficient. At Artesia, with 13 inch growing season precipitation, a width of 84 inches and 8 inch depth was adequate. Select a width based upon local precipitation patterns, soil texture, and evaporation/transportation rates.

If linear, build the vee ditch to a grade which will not wash out. Do not cross runoff channels, but interrupt the vee ditch. Construct turnouts at intervals so that large amounts of runoff will not cause erosion or deposition within the plant rows.

STEP THREE - Incorporate a preemergent herbicide into the completed catchments.

STEP FOUR - If the soil is heavy or compacted, rip the bottom of the furrow.

STEP FIVE - Plant into the furrow, at a spacing appropriate to the species. The method lends itself to machine planting with a tree planter.

STEP SIX - Seal part or all of the side slopes, using one of the following:

a) On heavy soils, compacting by vehicle tires may be sufficient to seal the soil surface.

b) Commercially available liquid sealants can be applied by pressure sprayer. Weed control can be spotty.

c) Black polyester film, in 6 mil thickness, can be used to cover the side slopes. The least expensive grades of plastic film must be covered with a straw or wood chip mulch to prevent sunlight from causing deterioration of the film. These plastic films can last for two growing seasons if kept covered.

d) Polyethelene woven or felted landscape fabrics will usually be ultraviolet protected. These fabrics allow water to penetrate, reducing the amount of runoff reaching the furrows. Some weeds will germinate and grow through these fabrics. Landscape fabrics can last for two or more years.

e) Black polyolifin film has ultraviolet protection, requires no organic coverings, sheds all of the precipitation, and prevents weed growth. These reinforced films may last for five years.

f) Tarpaper, of the 30 pound roofing felt class, is a very effective soil sealant and controls weed growth. Tarpaper has lasted well for two years.

If plants are to be put in with a tree planter, it will be necessary to apply separate rolls of film on each side slope. Overlap along the furrow edge. If plants are put in by hand it works best to cover the entire vee ditch and both side slopes with a single width of film. Cut holes at the proper spacing, keeping the holes small. Planting with a bucket auger or sharp shooter works well.

STEP SEVEN - Secure the edges of the plastic film or tarpaper with large wire staples. These staples are available in 6" x 1" or 8" x 2" sizes.

Field trials of this method has shown that survival of adapted plants can equal survival with irrigation. Plant growth is less without irrigation; but is still acceptable.

Although testing has not yet been done in areas with lower precipitation, proper sizing of the catchment area should result in decent plant survival and growth.